



SEQUENCE LISTING

<10> Patten, Phillip
Stemmer, Willem P.C.

<120> METHODS AND COMPOSITIONS FOR POLYPEPTIDE ENGINEERING

<130> 02-020501US

<140> 09/339,926

<141> 1999-06-24

<150> 08/769,062

<151> 1996-12-18

<150> 08/198,431

<151> 1994-02-17

<150> 08/425,684

<151> 1995-04-18

<150> 08/537,874

<151> 1995-10-30

<160> 101

<170> PatentIn Ver. 2.0

<210> 1

<211> 50

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: degenerate
oligonucleotide used for codon usage library

<400> 1

aaccctccag ttccgaaccc catatgatga tcaccctgcg taaactgccg 50

<210> 2

<211> 38

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: degenerate
oligonucleotide used for codon usage library

<400> 2

aaccctccag ttccgaaccc catatgaaaa aaaccgct 38

<210> 3

<211> 40

<212> DNA

<213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for codon usage library

 <400> 3
 aaccctccag ttccgaaccc atatacatat gcgtgctaaa 40

 <210> 4
 <211> 44
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for codon usage library

 <400> 4
 aaccctccag ttccgaaccc catatgaaat acctgctgcc gacc 44

 <210> 5
 <211> 40
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for codon usage library

 <400> 5
 aaccctccag ttccgaaccc gatatacata tgaaacagtc 40

 <210> 6
 <211> 60
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for codon usage library

 <400> 6
 tgggtgttatg tctgctcagg cdatggcdgt dgayttypay ctggttccgg ttgaagagga 60

 <210> 7
 <211> 60
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for codon usage library

 <400> 7
 ggctgggttc gctaccgttg cdccargcdgc dccdaargay ctggttccgg ttgaagagga 60

 <210> 8
 <211> 60

<212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for codon usage library

 <400> 8
 caccgccatc gctatctctt cyttygcdtc yacyggytcy ctggttccgg ttgaagagga 60

 <210> 9
 <211> 60
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for codon usage library

 <400> 9
 gctgctggct gctcagccgg cdatggcdat ggayatyggy ctggttccgg ttgaagagga 60

 <210> 10
 <211> 61
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for codon usage library

 <400> 10
 tgccgctgct gttcaccgccg gtdacyaarg cdgcdcargt dctggttccg gttgaagagg 60
 a 61

 <210> 11
 <211> 60
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for codon usage library

 <400> 11
 cccggctttc tggaaccgctc argcdgdcda rgcdctggac gttgctaaaa aactgcagcc 60

 <210> 12
 <211> 60
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for codon usage library

 <400> 12

acgttatcct gttcctgggt gayggyatgg gygtdccdac cgttaccgct acccgatatcc 60

<210> 13

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: degenerate
oligonucleotide used for codon usage library

<400> 13

aaactgggtc cggaaacccc dctggcdatg gaycarttyc cgtacgttgc tctgtctaaa 60

<210> 14

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: degenerate
oligonucleotide used for codon usage library

<400> 14

ggttcggtc tctgctggta cygcdacygc dtayctgtgc ggtgttaaag gtaactaccg 60

<210> 15

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: degenerate
oligonucleotide used for codon usage library

<400> 15

ctgctcggtt caaccagtgc aaracyacyc gyggyaayga agttacctct gttatgaacc 60

<210> 16

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: degenerate
oligonucleotide used for codon usage library

<400> 16

tctgttggtg ttgttaccac yacycgygtd carcaygtd ctccggctgg tgcttacgct 60

<210> 17

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: degenerate

oligonucleotide used for codon usage library

<400> 17

gtactctgac gctgacctgc cdgcdgaygc dcaratgaac ggttgccagg acatcgctgc 60

<210> 18

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: degenerate
oligonucleotide used for codon usage library

<400> 18

acatcgacgt tatcctgggt ggyggycgya artayatgtt cccggttggt accccggacc 60

<210> 19

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: degenerate
oligonucleotide used for codon usage library

<400> 19

tctgttaacg gtgttcgtaa rcgyaarcar aayctggtdc aggcttgga ggctaaacac 60

<210> 20

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: degenerate
oligonucleotide used for codon usage library

<400> 20

gaaccgtacc gctctgctgc argcdgcdga ygaytctct gttaccacc tgatgggtct 60

<210> 21

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: degenerate
oligonucleotide used for codon usage library

<400> 21

aatacaacgt tcagcaggac cayacyaarg ayccdacyct gcaggaaatg accgaagttg 60

<210> 22

<211> 60

<212> DNA

<213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for codon usage library

<400> 22
 aacccgcgtg gtttctacct gtttgtdgar ggyggycgya tcgaccacgg tcaccacgac 60

<210> 23
 <211> 60
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for codon usage library

<400> 23
 gaccgaagct ggtatgttcg ayaaygdat ygcdaargct aacgaactga cctctgaact 60

<210> 24
 <211> 60
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for codon usage library

<400> 24
 ccgctgacca ctctcacgtt ttytcttyg gyggytayac cctgcgtggt acctctatct 60

<210> 25
 <211> 60
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for codon usage library

<400> 25
 gctctggact ctaaacttta yacytctat yctgtayggya acggtccggg ttacgctctg 60

<210> 26
 <211> 60
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for codon usage library

<400> 26
 cgttaacgac tctacctctg argayccdtc ytaycarcag caggctgctg ttccgcaggc 60

<210> 27

<211> 60
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for codon usage library

 <400> 27
 aagacgttgc tgttttcgct cgyggyccdc argcdca yct ggttcacggt gttgaagaag 60

 <210> 28
 <211> 60
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for codon usage library

 <400> 28
 atggctttcg ctggttgcgt dgarccdtay acygaytg ya acctgccggc tccgaccacc 60

 <210> 29
 <211> 61
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for codon usage library

 <400> 29
 tgctcacctg gctgcttmac cdccddcdct ggc dctgctg gctgggtgcta tgctgctcct 60
 c 61

 <210> 30
 <211> 62
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for codon usage library

 <400> 30
 ttccgcctct agagaattct tartacagrg thgghgccag gaggagcagc atagcaccag 60
 cc 62

 <210> 31
 <211> 58
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for codon usage library

<400> 31
 aagcagccag gtgagcagcg tchggratrg argthgcggt ggtcggagcc ggcaggtt 58

 <210> 32
 <211> 60
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for codon usage library

 <400> 32
 cgcaaccagc gaaagccatg atrtghgcha craargtytc ttcttcaaca ccgtgaacca 60

 <210> 33
 <211> 60
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for codon usage library

 <400> 33
 gcgaaaacag caacgtcttc rccrcrtgr gtytcrgahg cctgcggaac agcagcctgc 60

 <210> 34
 <211> 60
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for codon usage library

 <400> 34
 agaggtagag tcgttaacgt chggrcgrga rccrccrccc agagcgtaac ccggaccgtt 60

 <210> 35
 <211> 60
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for codon usage library

 <400> 35
 aagatttaga gtccagagct ttrgahgghg ccagrccraa gatagaggta ccacgcaggg 60

 <210> 36
 <211> 60
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for codon usage library

 <400> 36
 acgtgagagt ggtcagcggg haccagratc agrgtrtcca gttcagaggt cagttcgtta 60

 <210> 37
 <211> 60
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for codon usage library

 <400> 37
 gaacatacca gcttcgggtca ghgccatrta hgcyttrtcg tcgtgggtgac cgtgggtcgat 60

 <210> 38
 <211> 60
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for codon usage library

 <400> 38
 ggtagaaacc acgcgggtta cgrgahacha crcgcaghgc aacttcgggtc atttcctgca 60

 <210> 39
 <211> 60
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for codon usage library

 <400> 39
 tcctgctgaa cgttgtatatt catrtchgch ggytcraaca gacccatcag gtgggtaaca 60

 <210> 40
 <211> 60
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for codon usage library

 <400> 40
 cagcagagcg gtacgggttcc ahacrtaytg hgcrccytgg tgtttagcct gccaaagcctg 60

 <210> 41
 <211> 60

<212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for codon usage library

 <400> 41
 tacgaacacc gttaacagaa gcrtcrtchg grtaytchgg gtccggggta ccaaccggga 60

 <210> 42
 <211> 60
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for codon usage library

 <400> 42
 cccaggataa cgctgatgtc catrttrtth accagytghg cagcgatgtc ctggcaaccg 60

 <210> 43
 <211> 60
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for codon usage library

 <400> 43
 caggtcagcg tcagagtacc arttrcgrrt hacrgtrtga gcgtaagcac cagccggaga 60

 <210> 44
 <211> 60
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for codon usage library

 <400> 44
 tggtacaac accaacagat ttrcchgcyt tytthgcrpg gttcataaca gaggtaactt 60

 <210> 45
 <211> 60
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for codon usage library

 <400> 45
 cactggttgt aacgagcagc hgcrghacr ccratrgrtc ggtagttacc tttaacaccg 60

<210> 46
 <211> 60
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for codon usage library

 <400> 46
 accagcagag tccggaacct ggcgrtchac rttrtargtt ttagacagag caacgtacgg 60

 <210> 47
 <211> 60
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for codon usage library

 <400> 47
 gggtttccgg acccagttta ccrttcatyt grccyttcag gatacgggta gcggtaacgg 60

 <210> 48
 <211> 60
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for codon usage library

 <400> 48
 cccaggaaca ggataacgtt ytthgchgcr gtytgrathg gctgcagttt ttagcaacg 60

 <210> 49
 <211> 42
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for codon usage library

 <400> 49
 acggttccag aaagccgggt cttcctcttc aaccggaacc ag 42

 <210> 50
 <211> 60
 <212> DNA
 <213> Artificial Sequence

 <220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for codon usage library

<400> 50
cctgagcaga cataacacca gchgchachg chachgccag cggcagttta cgcaggggtga 60

<210> 51

<211> 62

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: degenerate
oligonucleotide used for codon usage library

<400> 51
accgggggtga acagcagcgg cagcaghgcc aghgcratrg trgactgttt catatgtata 60
tc 62

<210> 52

<211> 59

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: degenerate
oligonucleotide used for codon usage library

<400> 52
gccggctgag cagccagcag cagcagrcch gchgchgcgg tcggcagcag gtagtttca 59

<210> 53

<211> 60

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: degenerate
oligonucleotide used for codon usage library

<400> 53
aagagatagc gatcgggggtg gtcaghacra trcccagcag ttttagcacgc atatgtatat 60

<210> 54

<211> 58

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: degenerate
oligonucleotide used for codon usage library

<400> 54
caacggtagc gaaaccagcc aghgchachg crathgcrat agcggttttt ttcatatg 58

<210> 55

<211> 39

<212> DNA

<213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for codon usage library

<400> 55
 agaattctct agaggcggaa actctccaac tcccagggtt 39

<210> 56
 <211> 39
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for codon usage library

<400> 56
 tgagagggtg aggggtccaat tgggagggtca aggcttggg 39

<210> 57
 <211> 18
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for alpha interferon
 shuffling

<400> 57
 tgtratctgy ctsagacc 18

<210> 58
 <211> 23
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for alpha interferon
 shuffling

<400> 58
 ggcacaaatg vgmagaatct ctc 23

<210> 59
 <211> 22
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for alpha interferon
 shuffling

<400> 59

agagattctk cbcatttggtg cc	22
<210> 60	
<211> 24	
<212> DNA	
<213> Artificial Sequence	
<220>	
<223> Description of Artificial Sequence: degenerate oligonucleotide used for alpha interferon shuffling	
<400> 60	
cagttccaga agrctsmagc catc	24
<210> 61	
<211> 24	
<212> DNA	
<213> Artificial Sequence	
<220>	
<223> Description of Artificial Sequence: degenerate oligonucleotide used for alpha interferon shuffling	
<400> 61	
gatggctksa gycttctgga actg	24
<210> 62	
<211> 19	
<212> DNA	
<213> Artificial Sequence	
<220>	
<223> Description of Artificial Sequence: degenerate oligonucleotide used for alpha interferon shuffling	
<400> 62	
cttcaatctc ttcascaca	19
<210> 63	
<211> 19	
<212> DNA	
<213> Artificial Sequence	
<220>	
<223> Description of Artificial Sequence: degenerate oligonucleotide used for alpha interferon shuffling	
<400> 63	
tgtgstgaag agattgaag	19
<210> 64	
<211> 18	
<212> DNA	

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: degenerate
oligonucleotide used for alpha interferon
shuffling

<400> 64

ggawsagass ctcctaga

18

<210> 65

<211> 18

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: degenerate
oligonucleotide used for alpha interferon
shuffling

<400> 65

tctaggagss tctswtcc

18

<210> 66

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: degenerate
oligonucleotide used for alpha interferon
shuffling

<400> 66

gaacttdwcc agcaamtgaa t

21

<210> 67

<211> 21

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: degenerate
oligonucleotide used for alpha interferon
shuffling

<400> 67

attcakttgc tggwhaagtt c

21

<210> 68

<211> 19

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: degenerate
oligonucleotide used for alpha interferon

shuffling

<400> 68
ggactycatc ctggctgtg 19

<210> 69
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: degenerate
oligonucleotide used for alpha interferon
shuffling

<400> 69
cacagccagg atgragtcc 19

<210> 70
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: degenerate
oligonucleotide used for alpha interferon
shuffling

<400> 70
aagaatcact ctttatct 18

<210> 71
<211> 18
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: degenerate
oligonucleotide used for alpha interferon
shuffling

<400> 71
agataaagag tgattctt 18

<210> 72
<211> 19
<212> DNA
<213> Artificial Sequence

<220>
<223> Description of Artificial Sequence: degenerate
oligonucleotide used for alpha interferon
shuffling

<400> 72
tgaggagggtg tcagagcag 19

<210> 73
 <211> 19
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for alpha interferon
 shuffling

<400> 73
 ctgctctgac aacctccca 19

<210> 74
 <211> 18
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> Description of Artificial Sequence: degenerate
 oligonucleotide used for alpha interferon
 shuffling

<400> 74
 tcawtccttm ctcyttaa 18

<210> 75
 <211> 166
 <212> PRT
 <213> consensus alpha interferon

<400> 75
 Cys Asp Leu Pro Gln Thr His Ser Leu Gly Asn Arg Arg Ala Leu Ile
 1 5 10 15
 Leu Leu Ala Gln Met Gly Arg Ile Ser Pro Phe Ser Cys Leu Lys Asp
 20 25 30
 Arg His Asp Phe Gly Phe Pro Gln Glu Glu Phe Asp Gly Asn Gln Phe
 35 40 45
 Gln Lys Ala Gln Ala Ile Ser Val Leu His Glu Met Ile Gln Gln Thr
 50 55 60
 Phe Asn Leu Phe Ser Thr Lys Asp Ser Ser Ala Ala Trp Glu Gln Ser
 65 70 75 80
 Leu Leu Glu Lys Phe Ser Thr Glu Leu Tyr Gln Gln Leu Asn Asp Leu
 85 90 95
 Glu Ala Cys Val Ile Gln Glu Val Gly Val Glu Glu Thr Pro Leu Met
 100 105 110
 Asn Glu Asp Ser Ile Leu Ala Val Arg Lys Tyr Phe Gln Arg Ile Thr
 115 120 125
 Leu Tyr Leu Thr Glu Lys Lys Tyr Ser Pro Cys Ala Trp Glu Val Val

130

135

140

Arg Ala Glu Ile Met Arg Ser Leu Ser Phe Ser Thr Asn Leu Gln Lys
 145 150 155 160

Arg Leu Arg Arg Lys Asp
 165

<210> 76

<211> 166

<212> PRT

<213> human alpha interferon

<400> 76

Cys Asp Leu Pro Gln Thr His Ser Leu Gly Asn Arg Arg Ala Leu Ile
 1 5 10 15

Leu Leu Ala Gln Met Gly Arg Ile Ser Pro Phe Ser Cys Leu Lys Asp
 20 25 30

Arg His Asp Phe Gly Leu Pro Gln Glu Glu Phe Asp Gly Asn Gln Phe
 35 40 45

Gln Lys Thr Gln Ala Ile Pro Val Leu His Glu Met Ile Gln Gln Thr
 50 55 60

Phe Asn Leu Phe Ser Thr Glu Asp Ser Ser Ala Ala Trp Glu Gln Ser
 65 70 75 80

Leu Leu Glu Lys Phe Ser Thr Glu Leu Tyr Gln Gln Leu Asn Asn Leu
 85 90 95

Glu Ala Cys Val Ile Gln Glu Val Gly Met Glu Glu Thr Pro Leu Met
 100 105 110

Asn Glu Asp Ser Ile Leu Ala Val Arg Lys Tyr Phe Gln Arg Ile Thr
 115 120 125

Leu Tyr Leu Thr Glu Lys Lys Tyr Ser Pro Cys Ala Trp Glu Val Val
 130 135 140

Arg Ala Glu Ile Met Arg Ser Leu Ser Phe Ser Thr Asn Leu Gln Lys
 145 150 155 160

Arg Leu Arg Arg Lys Asp
 165

<210> 77

<211> 166

<212> PRT

<213> human alpha interferon

<400> 77

Cys Asp Leu Pro Gln Thr His Ser Leu Gly Asn Arg Arg Ala Leu Ile
 1 5 10 15

Leu Leu Ala Gln Met Gly Arg Ile Ser Pro Phe Ser Cys Leu Lys Asp
 20 25 30
 Arg Pro Asp Phe Gly Leu Pro Gln Glu Glu Phe Asp Gly Asn Gln Phe
 35 40 45
 Gln Lys Thr Gln Ala Ile Ser Val Leu His Glu Met Ile Gln Gln Thr
 50 55 60
 Phe Asn Leu Phe Ser Thr Glu Asp Ser Ser Ala Ala Trp Glu Gln Ser
 65 70 75 80
 Leu Leu Glu Lys Phe Ser Thr Glu Leu Tyr Gln Gln Leu Asn Asn Leu
 85 90 95
 Glu Ala Cys Val Ile Gln Glu Val Gly Met Glu Glu Thr Pro Leu Met
 100 105 110
 Asn Glu Asp Ser Ile Leu Ala Val Arg Lys Tyr Phe Gln Arg Ile Thr
 115 120 125
 Leu Tyr Leu Thr Glu Lys Lys Tyr Ser Pro Cys Ala Trp Glu Val Val
 130 135 140
 Arg Ala Glu Ile Met Arg Ser Leu Ser Phe Ser Thr Asn Leu Gln Lys
 145 150 155 160
 Ile Leu Arg Arg Lys Asp
 165

<210> 78

<211> 166

<212> PRT

<213> human alpha interferon

<400> 78

Cys Asn Leu Ser Gln Thr His Ser Leu Asn Asn Arg Arg Thr Leu Met
 1 5 10 15
 Leu Leu Ala Gln Met Arg Arg Ile Ser Pro Phe Ser Cys Leu Lys Asp
 20 25 30
 Arg His Asp Phe Glu Phe Pro Gln Glu Glu Phe Asp Gly Asn Gln Phe
 35 40 45
 Gln Lys Ala Gln Ala Ile Ser Val Leu His Glu Met Met Gln Gln Thr
 50 55 60
 Phe Asn Leu Phe Ser Thr Lys Asn Ser Ser Ala Ala Trp Asp Glu Thr
 65 70 75 80
 Leu Leu Glu Lys Phe Tyr Ile Glu Leu Phe Gln Gln Met Asn Asp Leu
 85 90 95
 Glu Ala Cys Val Ile Gln Glu Val Gly Val Glu Glu Thr Pro Leu Met

100	105	110
Asn Glu Asp Ser Ile Leu Ala Val Lys Lys Tyr Phe Gln Arg Ile Thr		
115	120	125
Leu Tyr Leu Met Glu Lys Lys Tyr Ser Pro Cys Ala Trp Glu Val Val		
130	135	140
Arg Ala Glu Ile Met Arg Ser Leu Ser Phe Ser Thr Asn Leu Gln Lys		
145	150	155
160		
Arg Leu Arg Arg Lys Asp		
165		

<210> 79

<211> 166

<212> PRT

<213> human alpha interferon

<400> 79

Cys Asp Leu Pro Gln Thr His Ser Leu Gly Asn Arg Arg Ala Leu Ile		
1	5	10
15		
Leu Leu Ala Gln Met Gly Arg Ile Ser His Phe Ser Cys Leu Lys Asp		
20	25	30
Arg His Asp Phe Gly Phe Pro Glu Glu Phe Asp Gly His Gln Phe		
35	40	45
Gln Lys Thr Gln Ala Ile Ser Val Leu His Glu Met Ile Gln Gln Thr		
50	55	60
Phe Asn Leu Phe Ser Thr Glu Asp Ser Ser Ala Ala Trp Glu Gln Ser		
65	70	75
80		
Leu Leu Glu Lys Phe Ser Thr Glu Leu Tyr Gln Gln Leu Asn Asp Leu		
85	90	95
Glu Ala Cys Val Ile Gln Glu Val Gly Val Glu Glu Thr Pro Leu Met		
100	105	110
Asn Val Asp Ser Ile Leu Ala Val Arg Lys Tyr Phe Gln Arg Ile Thr		
115	120	125
Leu Tyr Leu Thr Glu Lys Lys Tyr Ser Pro Cys Ala Trp Glu Val Val		
130	135	140
Arg Ala Glu Ile Met Arg Ser Leu Ser Phe Ser Thr Asn Leu Gln Lys		
145	150	155
160		
Arg Leu Arg Arg Lys Asp		
165		

<210> 80

<211> 166

<212> PRT

<213> human alpha interferon

<400> 80

Cys Asp Leu Pro Gln Thr His Ser Leu Gly His Arg Arg Thr Met Met
1 5 10 15

Leu Leu Ala Gln Met Arg Arg Ile Ser Leu Phe Ser Cys Leu Lys Asp
20 25 30

Arg His Asp Phe Arg Phe Pro Gln Glu Glu Phe Asp Gly Asn Gln Phe
35 40 45

Gln Lys Ala Glu Ala Ile Ser Val Leu His Glu Val Ile Gln Gln Thr
50 55 60

Phe Asn Leu Phe Ser Thr Lys Asp Ser Ser Val Ala Trp Asp Glu Arg
65 70 75 80

Leu Leu Asp Lys Leu Tyr Thr Glu Leu Tyr Gln Gln Leu Asn Asp Leu
85 90 95

Glu Ala Cys Val Met Gln Glu Val Trp Val Gly Gly Thr Pro Leu Met
100 105 110

Asn Glu Asp Ser Ile Leu Ala Val Arg Lys Tyr Phe Gln Arg Ile Thr
115 120 125

Leu Tyr Leu Thr Glu Lys Lys Tyr Ser Pro Cys Ala Trp Glu Val Val
130 135 140

Arg Ala Glu Ile Met Arg Ser Phe Ser Ser Ser Arg Asn Leu Gln Glu
145 150 155 160

Arg Leu Arg Arg Lys Glu
165

<210> 81

<211> 166

<212> PRT

<213> human alpha interferon

<400> 81

Cys Asp Leu Pro Gln Thr His Ser Leu Arg Asn Arg Arg Ala Leu Ile
1 5 10 15

Leu Leu Ala Gln Met Gly Arg Ile Ser Pro Phe Ser Cys Leu Lys Asp
20 25 30

Arg His Glu Phe Arg Phe Pro Glu Glu Glu Phe Asp Gly His Gln Phe
35 40 45

Gln Lys Thr Gln Ala Ile Ser Val Leu His Glu Met Ile Gln Gln Thr
50 55 60

Phe Asn Leu Phe Ser Thr Glu Asp Ser Ser Ala Ala Trp Glu Gln Ser

65		70		75		80									
Leu	Leu	Glu	Lys	Phe	Ser	Thr	Glu	Leu	Tyr	Gln	Gln	Leu	Asn	Asp	Leu
				85					90					95	
Glu	Ala	Cys	Val	Ile	Gln	Glu	Val	Gly	Val	Glu	Glu	Thr	Pro	Leu	Met
			100					105					110		
Asn	Glu	Asp	Phe	Ile	Leu	Ala	Val	Arg	Lys	Tyr	Phe	Gln	Arg	Ile	Thr
		115					120					125			
Leu	Tyr	Leu	Met	Glu	Lys	Lys	Tyr	Ser	Pro	Cys	Ala	Trp	Glu	Val	Val
	130					135					140				
Arg	Ala	Glu	Ile	Met	Arg	Ser	Phe	Ser	Phe	Ser	Thr	Asn	Leu	Lys	Lys
145					150					155					160
Gly	Leu	Arg	Arg	Lys	Asp										
				165											

<210> 82
 <211> 166
 <212> PRT
 <213> human alpha interferon

<400> 82
Cys Asp Leu Pro Gln Thr His Ser Leu Gly Asn Arg Arg Ala Leu Ile
1 5 10 15
Leu Leu Ala Gln Met Arg Arg Ile Ser Pro Phe Ser Cys Leu Lys Asp
20 25 30
Arg His Asp Phe Glu Phe Pro Gln Glu Glu Phe Asp Asp Lys Gln Phe
35 40 45
Gln Lys Ala Gln Ala Ile Ser Val Leu His Glu Met Ile Gln Gln Thr
50 55 60
Phe Asn Leu Phe Ser Thr Lys Asp Ser Ser Ala Ala Leu Asp Glu Thr
65 70 75 80
Leu Leu Asp Glu Phe Tyr Ile Glu Leu Asp Gln Gln Leu Asn Asp Leu
85 90 95
Glu Ser Cys Val Met Gln Glu Val Gly Val Ile Glu Ser Pro Leu Met
100 105 110
Tyr Glu Asp Ser Ile Leu Ala Val Arg Lys Tyr Phe Gln Arg Ile Thr
115 120 125
Leu Tyr Leu Thr Glu Lys Lys Tyr Ser Ser Cys Ala Trp Glu Val Val
130 135 140
Arg Ala Glu Ile Met Arg Ser Phe Ser Leu Ser Ile Asn Leu Gln Lys
145 150 155 160

Arg Leu Lys Ser Lys Glu
165

<210> 83
<211> 166
<212> PRT
<213> human alpha interferon

<400> 83
Cys Asp Leu Pro Glu Thr His Ser Leu Asp Asn Arg Arg Thr Leu Met
1 5 10 15
Leu Leu Ala Gln Met Ser Arg Ile Ser Pro Ser Ser Cys Leu Met Asp
20 25 30
Arg His Asp Phe Gly Phe Pro Gln Glu Glu Phe Asp Gly Asn Gln Phe
35 40 45
Gln Lys Ala Pro Ala Ile Ser Val Leu His Glu Leu Ile Gln Gln Ile
50 55 60
Phe Asn Leu Phe Thr Thr Lys Asp Ser Ser Ala Ala Trp Asp Glu Asp
65 70 75 80
Leu Leu Asp Lys Phe Cys Thr Glu Leu Tyr Gln Gln Leu Asn Asp Leu
85 90 95
Glu Ala Cys Val Met Gln Glu Glu Arg Val Gly Glu Thr Pro Leu Met
100 105 110
Asn Ala Asp Ser Ile Leu Ala Val Lys Lys Tyr Phe Arg Arg Ile Thr
115 120 125
Leu Tyr Leu Thr Glu Lys Lys Tyr Ser Pro Cys Ala Trp Glu Val Val
130 135 140
Arg Ala Glu Ile Met Arg Ser Leu Ser Leu Ser Thr Asn Leu Gln Glu
145 150 155 160
Arg Leu Arg Arg Lys Glu
165

<210> 84
<211> 166
<212> PRT
<213> human alpha interferon

<400> 84
Cys Asp Leu Pro Gln Thr His Ser Leu Gly Asn Arg Arg Ala Leu Ile
1 5 10 15
Leu Leu Ala Gln Met Gly Arg Ile Ser Pro Phe Ser Cys Leu Lys Asp
20 25 30
Arg His Asp Phe Gly Phe Pro Gln Glu Glu Phe Asp Gly Asn Gln Phe

35					40					45						
Gln	Lys	Ala	Gln	Ala	Ile	Ser	Val	Leu	His	Glu	Met	Ile	Gln	Gln	Thr	
50					55					60						
Phe	Asn	Leu	Phe	Ser	Thr	Lys	Asp	Ser	Ser	Ala	Ile	Trp	Glu	Gln	Ser	
65					70					75					80	
Leu	Leu	Glu	Lys	Phe	Ser	Thr	Glu	Leu	Asn	Gln	Gln	Leu	Asn	Asp	Met	
					85					90					95	
Glu	Ala	Cys	Val	Ile	Gln	Glu	Val	Gly	Val	Glu	Glu	Thr	Pro	Leu	Met	
100					105					110						
Asn	Val	Asp	Ser	Ile	Leu	Ala	Val	Lys	Lys	Tyr	Phe	Gln	Arg	Ile	Thr	
115					120					125						
Leu	Tyr	Leu	Thr	Glu	Lys	Lys	Tyr	Ser	Pro	Cys	Ala	Trp	Glu	Val	Val	
130					135					140						
Arg	Ala	Glu	Ile	Met	Arg	Ser	Phe	Ser	Leu	Ser	Lys	Ile	Phe	Gln	Glu	
145					150					155					160	
Arg	Leu	Arg	Arg	Lys	Ser											
165																

<210> 85
 <211> 166
 <212> PRT
 <213> human alpha interferon

<400> 85															
Cys	Asp	Leu	Pro	Gln	Thr	His	Ser	Leu	Gly	Asn	Arg	Arg	Ala	Leu	Ile
1				5				10				15			
Leu	Leu	Ala	Gln	Met	Gly	Arg	Ile	Ser	Pro	Phe	Ser	Cys	Leu	Lys	Asp
				20				25				30			
Arg	Pro	Asp	Phe	Gly	Leu	Pro	Gln	Glu	Glu	Phe	Asp	Gly	Asn	Gln	Phe
35				40				45							
Gln	Lys	Thr	Gln	Ala	Ile	Ser	Val	Leu	His	Glu	Met	Ile	Gln	Gln	Thr
50				55				60							
Phe	Asn	Leu	Phe	Ser	Thr	Glu	Asp	Ser	Ser	Ala	Ala	Trp	Glu	Gln	Ser
65				70				75				80			
Leu	Leu	Glu	Lys	Phe	Ser	Thr	Glu	Leu	Tyr	Gln	Gln	Leu	Asn	Asn	Leu
				85				90				95			
Glu	Ala	Cys	Val	Ile	Gln	Glu	Val	Gly	Met	Glu	Glu	Thr	Pro	Leu	Met
100				105				110							
Asn	Glu	Asp	Ser	Ile	Leu	Ala	Val	Arg	Lys	Tyr	Phe	Gln	Arg	Ile	Thr
115				120				125							

Leu Tyr Leu Thr Glu Lys Lys Tyr Ser Pro Cys Ala Trp Glu Val Val
 130 135 140

Arg Ala Glu Ile Met Arg Ser Leu Ser Phe Ser Thr Asn Leu Gln Lys
 145 150 155 160

Ile Leu Arg Arg Lys Asp
 165

<210> 86
 <211> 166
 <212> PRT
 <213> human alpha interferon

<400> 86
 Cys Asp Leu Pro Gln Thr His Ser Leu Gly Asn Arg Arg Ala Leu Ile
 1 5 10 15

Leu Leu Ala Gln Met Gly Arg Ile Ser His Phe Ser Cys Leu Lys Asp
 20 25 30

Arg Tyr Asp Phe Gly Phe Pro Gln Glu Val Phe Asp Gly Asn Gln Phe
 35 40 45

Gln Lys Ala Gln Ala Ile Ser Ala Phe His Glu Met Ile Gln Gln Thr
 50 55 60

Phe Asn Leu Phe Ser Thr Lys Asp Ser Ser Ala Ala Trp Asp Glu Thr
 65 70 75 80

Leu Leu Asp Lys Phe Tyr Ile Glu Leu Phe Gln Gln Leu Asn Asp Leu
 85 90 95

Glu Ala Cys Val Thr Gln Glu Val Gly Val Glu Glu Ile Ala Leu Met
 100 105 110

Asn Glu Asp Ser Ile Leu Ala Val Arg Lys Tyr Phe Gln Arg Ile Thr
 115 120 125

Leu Tyr Leu Met Gly Lys Lys Tyr Ser Pro Cys Ala Trp Glu Val Val
 130 135 140

Arg Ala Glu Ile Met Arg Ser Phe Ser Phe Ser Thr Asn Leu Gln Lys
 145 150 155 160

Gly Leu Arg Arg Lys Asp
 165

<210> 87
 <211> 501
 <212> DNA
 <213> consensus alpha interferon

<400> 87
 tgtgatctgc ctcagaccca cagcctgggt aataggaggg ccttgatact cctggcacia 60

```

atgggaagaa tctctccttt ctctgcctg aaggacagac atgacttttg atttccccag 120
gaggagtttg atggcaacca gttccagaag gctcaagcca tctctgtcct ccatgagatg 180
atccagcaga ctttcaatct cttcagcaca aaggactcat ctgctgcttg ggatgagagc 240
ctcctagaaa aattttccac tgaactttac cagcaactga atgacctgga agcctgtgtg 300
atacaggagg ttgggggtgga agagactccc ctgatgaatg aggactccat cctggctgtg 360
aggaataact tccaaagaat cactctttat ctgacagaga agaaatacag cccttgtgcc 420
tgaggaggtt tcagagcaga aatcatgaga tcttctctt tttcaacaaa cttgcaaaaa 480
agattaagga ggaaggattg a 501

```

<210> 88

<211> 501

<212> DNA

<213> human alpha interferon

<400> 88

```

tgtgatctgc ctcagaccca cagcctgggt aataggaggg ccttgatact cctggcacia 60
atgggaagaa tctctccttt ctctgcctg aaggacagac atgacttttg acttccccag 120
gaggagtttg atggcaacca gttccagaag actcaagcca tccctgtcct ccatgagatg 180
atccagcaga ctttcaatct cttcagcaca gaggactcat ctgctgcttg ggaacagagc 240
ctcctagaaa aattttccac tgaactttac cagcaactga ataacctgga agcatgtgtg 300
atagaggagg ttgggatgga agagactccc ctgatgaatg aggactccat cctggctgtg 360
aggaataact tccaaagaat cactctttat ctaacagaga agaaatacag cccttgtgcc 420
tgaggaggtt tcagagcaga aatcatgaga tccctctctt tttcaacaaa cttgcaaaaa 480
agattaagga ggaaggattg a 501

```

<210> 89

<211> 501

<212> DNA

<213> human alpha interferon

<400> 89

```

tgtgatctgc ctcagaccca cagcctgggt aataggaggg ccttgatact cctggcacia 60
atgggaagaa tctctccttt ctctgcctg aaggacagac atgacttttg acttccccag 120
gaggagtttg atggcaacca gttccagaag actcaagcca tctctgtcct ccatgagatg 180
atccagcaga ctttcaatct cttcagcaca gaggactcat ctgctgcttg ggaacagagc 240
ctcctagaaa aattttccac tgaactttac cagcaactga ataacctgga agcatgtgtg 300
atacaggagg ttgggatgga agagactccc ctgatgaatg aggactccat cctggctgtg 360
aggaataact tccaaagaat cactctttat ctaacagaga agaaatacag cccttgtgcc 420
tgaggaggtt tcagagcaga aatcatgaga tctctctctt tttcaacaaa cttgcaaaaa 480
atattaagga ggaaggattg a 501

```

<210> 90

<211> 501

<212> DNA

<213> human alpha interferon

<400> 90

```

tgtaatctgt ctcaaaccce cagcctgaat aacaggagga ctttgatgct catggcacia 60
atgaggagaa tctctccttt ctctgcctg aaggacagac atgactttga atttccccag 120
gaggaatttg atggcaacca gttccagaaa gctcaagcca tctctgtcct ccatgagatg 180
atgcagcaga ctttcaatct cttcagcaca aagaactcat ctgctgcttg ggatgagacc 240
ctcctagaaa aattctacat tgaactttt cagcaaatga atgacctgga agcctgtgtg 300
atacaggagg ttgggggtgga agagactccc ctgatgaatg aggactccat cctggctgtg 360
aagaaatact tccaaagaat cactctttat ctgatggaga agaaatacag cccttgtgcc 420
tgaggaggtt tcagagcaga aatcatgaga tccctctctt tttcaacaaa cttgcaaaaa 480
agattaagga ggaaggattg a 501

```

<210> 91
 <211> 501
 <212> DNA
 <213> human alpha interferon

<400> 91
 tgtgatctgc ctcagaccca cagcctgggt aataggaggg ccttgatact cctggcacia 60
 atgggaagaa tctctccttt ctcatgcctg aaggacagac atgatttcgg attccccgag 120
 gaggagtttg atggccacca gttccagaag actcaagcca tctctgtcct ccatgagatg 180
 atccagcaga ccttcaatct cttcagcaca gaggactcat ctgctgcttg ggaacagagc 240
 ctccatgaaa aattttccac tgaactttac cagcaactga atgacctgga agcatgtgtg 300
 atacaggagg ttgggggtgga agagactccc ctgatgaatg tggactccat cctggctgtg 360
 aggaaatact tccaaagaat cactctttat ctaacagaga agaaatacag cccttgtgcc 420
 tgggaggttg tcagagcaga aatcatgaga tccctctcgt tttcaacaaa cttgcaaaaa 480
 agattaagga ggaaggattg a 501

<210> 92
 <211> 501
 <212> DNA
 <213> human alpha interferon

<400> 92
 tgtgatctgc ctcagaccca cagcctgggt cacaggagga ccatgatgct cctggcacia 60
 atgaggagaa tctctccttt ctccgtctg aaggacagac atgacttcag atttccccag 120
 gaggagtttg atggcaacca gttccagaag gctgaagcca tctctgtcct ccatgagggtg 180
 attcagcaga ccttcaatct cttcagcaca aaggactcat ctgttgcttg ggatgagagg 240
 ctctagaca aactctatac tgaactttac cagcagctga atgacctgga agcctgtgtg 300
 atgcaggagg tgtgggtggg agggactccc ctgatgaatg aggactccat cctggctgtg 360
 agaaaatact tccaaagaat cactctctac ctgacagaga aaaagtacag cccttgtgcc 420
 tgggaggttg tcagagcaga aatcatgaga tccctctctt catcaagaaa cttgcaagaa 480
 aggttaagga ggaaggaata a 501

<210> 93
 <211> 501
 <212> DNA
 <213> human alpha interferon

<400> 93
 tgtgatctgc ctcagaccca cagcctgcgt aataggaggg ccttgatact cctggcacia 60
 atgggaagaa tctctccttt ctccgtctg aaggacagac atgaattcag attcccagag 120
 gaggagtttg atggccacca gttccagaag actcaagcca tctctgtcct ccatgagatg 180
 atccagcaga ccttcaatct cttcagcaca gaggactcat ctgctgcttg ggaacagagc 240
 ctccatgaaa aattttccac tgaactttac cagcaactga atgacctgga agcatgtgtg 300
 atacaggagg ttgggggtgga agagactccc ctgatgaatg aggactccat cctggctgtg 360
 aggaaatact tccaaagaat cactctttat ctaatggaga agaaatacag cccttgtgcc 420
 tgggaggttg tcagagcaga aatcatgaga tccctctctt tttcaacaaa cttgaaaaaa 480
 ggattaagga ggaaggattg a 501

<210> 94
 <211> 501
 <212> DNA
 <213> human alpha interferon

<400> 94
 tgtgatctgc ctcagactca cagcctgggt aacaggaggg ccttgatact cctggcacia 60
 atgcgaagaa tctctccttt ctccgtcctg aaggacagac atgactttga attccccag 120
 gaggagtttg atgataaaca gttccagaag gctcaagcca tctctgtcct ccatgagatg 180

atccagcaga	ccttcaacct	cttcagcaca	aaggactcat	ctgctgcttt	ggatgagacc	240
cttctagatg	aattctacat	cgaacttgac	cagcagctga	atgacctgga	gtcctgtgtg	300
atgcaggaag	tgggggtgat	agagtctccc	ctgatgaatg	aggacttcat	cctggctgtg	360
aggaaatact	tccaaagaat	cactctatat	ctgacagaga	agaaatacag	ctcttgtgcc	420
tgggaggttg	tcagagcaga	aatcatgaga	tccttctctt	tatcaatcaa	cttgcaaaaa	480
agattgaaga	gtaaggaatg	a				501

<210> 95

<211> 501

<212> DNA

<213> human alpha interferon

<400> 95

tgtgatctcc	ctgagaccca	cagcctggat	aacaggagga	ccttgatgct	cctggcacia	60
atgagcagaa	tctctccttc	ctcctgtctg	atggacagac	atgactttgg	atttccccag	120
gaggagtttg	atggcaacca	gttccagaag	gctccagcca	tctctgtcct	ccatgagctg	180
atccagcaga	ccttcaacct	cttctccaca	aaagattcat	ctgctgcttg	ggatgaggac	240
ctcctagaca	aattctgcac	cgaactctac	cagcagctga	atgacttgga	agcctgtgtg	300
atgcaggagg	agaggggtggg	agaaactccc	ctgatgtacg	cggactccat	cctggctgtg	360
aagaaatact	tccaaagaat	cactctctat	ctgacagaga	agaaatacag	cccttgtgcc	420
tgggaggttg	tcagagcaga	aatcatgaga	tccttctctt	tatcaacaaa	cttgcaagaa	480
agattaagga	ggaaggaata	a				501

<210> 96

<211> 501

<212> DNA

<213> human alpha interferon

<400> 96

tgtgatctgc	ctcagaccca	cagcctgggt	aataggaggg	ccttgatact	cctggcacia	60
atgggaagaa	tctctccttt	ctcctgcctg	aaggacagac	atgactttgg	attcccccaa	120
gaggagtttg	atggcaacca	gttccagaag	gctcaagcca	tctctgtcct	ccatgagatg	180
atccagcaga	ccttcaatct	cttcagcaca	aaggactcat	ctgctacttg	ggaacagagc	240
ctcctagaaa	aattttccac	tgaacttaac	cagcagctga	atgacatgga	agcctgcgtg	300
atacaggagg	ttgggggtgga	agagactccc	ctgatgaatg	tggactctat	cctggctgtg	360
aagaaatact	tccaaagaat	cactctttat	ctgacagaga	agaaatacag	cccttgtgct	420
tgggaggttg	tcagagcaga	aatcatgaga	tccttctctt	tatcaaaaaat	ttttcaagaa	480
agattaagga	ggaagggaatg	a				501

<210> 97

<211> 501

<212> DNA

<213> human alpha interferon

<400> 97

tgtgatctgc	ctcagaccca	cagcctgggt	aataggaggg	ccttgatact	cctggcacia	60
atgggaagaa	tctctccttt	ctcctgcctg	aaggacagac	ctgactttgg	acttccccag	120
gaggagtttg	atggcaacca	gttccagaag	actcaagcca	tctctgtcct	ccatgagatg	180
atccagcaga	ccttcaatct	cttcagcaca	gaggactcat	ctgctgcttg	ggaacagagc	240
ctcctagaaa	aattttccac	tgaactttac	cagcaactga	ataacctgga	agcatgtgtg	300
atacaggagg	ttgggatgga	agagactccc	ctgatgaatg	aggactccat	cttggctgtg	360
aggaaatact	tccaaagaat	cactctttat	ctaacagaga	agaaatacag	cccttgtgcc	420
tgggaggttg	tcagagcaga	aatcatgaga	tctctctctt	tttcaacaaa	cttgcaaaaa	480
agattaagga	ggaaggattg	a				501

<210> 98

<211> 501

<212> DNA

<213> human alpha interferon

<400> 98

```
tgtgatctgc ctcagactca cagcctgggt aataggaggg ccttgatact cctggcacaa 60
atgggaagaa tctctcattt ctcctgcctg aaggacagat atgatttcgg attccccag 120
gaggtgtttg atggcaacca gttccagaag gctcaagcca tctctgcctt ccatgagatg 180
atccagcaga ctttcaatct cttcagcaca aaggattcat ctgctgcttg ggatgagacc 240
ctcctagaca aattctacat tgaacttttc cagcaactga atgacctaga agcctgtgtg 300
acacaggagg ttgggggtgga agagattgcc ctgatgaatg aggactccat cctggctgtg 360
aggaataact ttcaaagaat cactctttat ctgatggaga agaaatacag cccttgtgcc 420
tgggaggttg tcagagcaga aatcatgaga tccttctctt tttcaacaaa cttgcaaaaa 480
ggattaagaa ggaaggattg a 501
```

<210> 99

<211> 11

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Protease
peptide substrate

<400> 99

```
Arg Gly Val Val Asn Ala Ser Ser Arg Leu Ala
  1             5             10
```

<210> 100

<211> 44

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Introduced Sfi
I site

<400> 100

```
ttccatttca tacatggccg aaggggccgt gccatgagga tttt 44
```

<210> 101

<211> 50

<212> DNA

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Introduced sfi
I site

<400> 101

```
ttctaaatgc atgttggcct ccttggccgg attctgagcc ttcaggacca 50
```